

# CARB Responses to Information Requested from the Environmental Justice Advisory Committee Regarding the Zero-Emission Space and Water Heating Standards Presentation on April 17, 2025

## A. What is the current state of zero-emission heating in California residential buildings?

Currently available zero-emission space and water heating technologies include electric resistance, heat pumps, and solar thermal systems.

To estimate the number of housing units with zero-emission (ZE) space and water heaters currently installed, CARB uses housing unit estimates from the California Energy Commission's (CEC) 2023 *Integrated Energy Policy Report* (IEPR) and equipment saturation rates from the *2019 California Residential Appliance Saturation Study (RASS)*. Table 1 provides the estimated number and percentage of residential buildings that currently have zero-emission space and water heating installed. Per RASS data, approximately 25% of ZE space heaters are heat pumps, and 10% of ZE water heaters are heat pumps with the remaining ZE equipment being primarily electric resistance technologies.

Table 1: Residential Zero-Emission Heating (2020)

Building type	Housing units <sup>1</sup>	ZE space heating <sup>2</sup>	ZE water heating
Single-family detached	8.26 million	1.73 million (21%)	0.33 million (4%)
Single-family attached	1.06 million	0.310 million (29%)	0.05 million (5%)
Multifamily 2-4 units	1.1 million	0.39 million (35%)	0.08 million (7%)
Multifamily 5+ units	3.4 million	1.4 million (41%)	0.34 million (10%)
Mobile and manufactured homes	0.5 million	0.07 million (13%)	0.03 million (5%)
<b>Total</b>	<b>14.4 million</b>	<b>3.9 million (27%)</b>	<b>0.83 million (6%)</b>

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<sup>1</sup> The housing unit totals in Table 1 are from the 2023 IEPR, which uses 2020 Department of Finance population reports and data from Moody's Analytics to estimate and forecast residential housing units. [https://dof.ca.gov/wp-content/uploads/sites/352/Forecasting/Demographics/Documents/E-5\\_2025\\_InternetVersion.xlsx](https://dof.ca.gov/wp-content/uploads/sites/352/Forecasting/Demographics/Documents/E-5_2025_InternetVersion.xlsx) The estimated space and water heating counts are based on 2019 RASS saturation data.

<sup>2</sup> Including primary and secondary heaters.

## B. How is residential zero-emission heating distributed across California's disadvantaged and fenceline communities?

EJAC committee members further requested breakdowns of zero-emission heating uptake within and outside of Disadvantaged Communities, defined as the top 25 percentile of census tracts scored for pollution burdens and population characteristics by [Cal EnviroScreen 4.0](#). For these more spatially granular analyses, CARB staff use census data ([2019 American Community Survey \(ACS\) \(Table B25040: House Heating Fuel\)](#)), since RASS data is only collected at the forecast zone scale. Estimates for water heating are not shown because it is not included in ACS data. Table 2 provides estimates with margins of error at a 90% confidence interval.

Table 2: Zero-emission space heating by Disadvantaged Community status.

Census tract status	Households <sup>3</sup>	Average percent of households with ZE space heating	Average percent of households with no space heating
CES 4.0 Disadvantaged Community	2.79 million (21%)	32.08% ± 0.35	7.98% ± .25
Not a CES 4.0 Disadvantaged Community	10.25 million (79%)	26.45% ± .26	2.37% ± .29
<b>Statewide</b>	<b>13.04 million</b>	<b>27.85% ± .22</b>	<b>3.77% ± .09</b>

On average, disadvantaged community census tracts have about 5 to 6 percent more households with zero-emission heating equipment installed than non-disadvantaged community tracts. Disadvantaged community tracts also have about 5 to 6 percent more households with no space heating fuel used at all.

Committee members also requested data on the number of households with zero-emission heating in fenceline communities. Although fenceline communities are not formally defined in California statute, CARB staff addressed this request by estimating the number of households, as reported in the 2019 American Community Survey, living near a Cap-and-Trade program capped facility with a compliance obligation (over 25,000 tons carbon dioxide equivalent (CO<sub>2</sub>e) emission per year) based on 2018<sup>4</sup> data from [CARB's Pollution Mapping Tool \(v2.6\)](#). Table 3 presents the estimates of the share of households with zero-

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<sup>3</sup> The term "households" includes occupied housing units only. The American Community Survey's sampling methods and occupancy definitions differ from the IEPR sources, so the total statewide units are different from Table 1.

<sup>4</sup> A more recent year was not used, because data was reported by ZIP codes, which have irregular geometries that are not well-suited to this analysis.

emission or no space heating, grouped by their proximity to capped facilities, with calculated margins of error.

Table 3: Zero-Emission Heating in Census Tracts Categorized by Proximity to Capped Facilities

Census tract status	Households	Average percent of households with ZE space heating	Average percent of households with no space heating
Containing a capped facility	0.27 million (2%)	32.03% ± 2.95	2.87% ± 0.01
Containing or within 2.5 miles of a capped facility	3.87 million (30%)	29.84% ± 0.50	5.41% ± 0.06
Not within 2.5 miles of a capped facility	9.18 million (70%)	26.99% ± 0.22	3.06% ± 0.06

Tracts within 2.5 miles of a capped facility have about 2 to 3 percent more households with zero-emission space heating equipment installed than those farther away, and about 2 percent more households with no space heating

### C. What progress has been made toward the 2022 Scoping Plan’s zero-emission heating goals?

The Scoping Plan set zero-emission targets for the residential and commercial building sector:

- 80% of residential appliance sales are electric by 2030 and 100% by 2035
- 80% of commercial appliance sales are electric by 2030, and 100% by 2045
- 100% zero-emission new construction by 2026
- 6 million heat pumps installed by 2030<sup>5</sup>

The *California Heat Pump Partnership Blueprint*, co-authored by state agency and industry advisory board members, estimates that of the over 1 million HVAC units sold annually in the state, roughly 20% are heat pump systems. For water heaters, of the approximately 800,000 units sold each year, only 3-5% are heat pump water heaters. The Blueprint projects that even with the implementation of current policies, codes, and incentives (excluding CARB’s potential zero-emission heating equipment standards), California is on track to only reach 4 million heat pumps by 2030, falling short of the 6 million goal by about 2 million units.

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<sup>5</sup> The 2022 Scoping Plan *AB32 GHG Inventory Sectors modeling* assumes that approximately 3 million heat pump space heaters and 3 million heat pump water heaters by 2030.

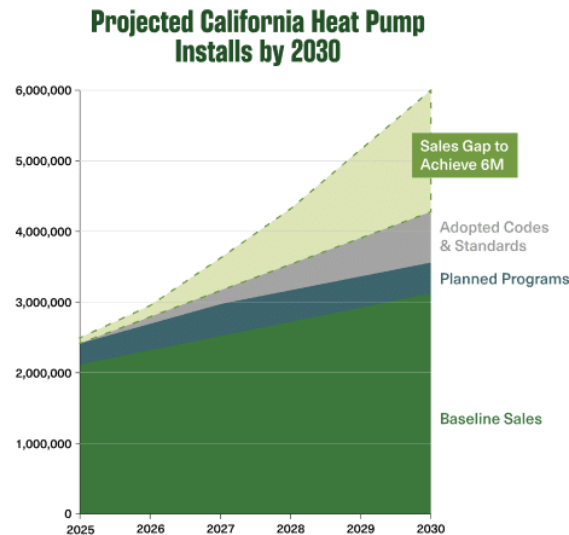


Figure 1: California Heat Pump Partnership Blueprint Projections

With respect to new construction, CEC’s CHEERS registry<sup>6</sup> data shows the share of heat pumps in new single-family homes increased from 30% to 55% of market share between 2020 and 2022. In multifamily new construction, heat pump space heating had over 80% of market share in new construction in 2022. According to investor-owned utility reports to the California Public Utilities Commission, in 2023, 61.72% of residential new construction projects that were energized in Pacific Gas and Electric (PG&E) service territory were all-electric buildings. In San Diego Gas and Electric (SDG&E), 36.26% of residential new construction projects were all-electric buildings, and in Southern California Edison (SCE), 3.76% were all-electric.<sup>7</sup>

<sup>6</sup> California's Building Energy Code Registry available at: <https://www.cheers.org/>

<sup>7</sup> California Public Utilities Commission “Building Decarbonization” page available at: <https://www.cpuc.ca.gov/about-cpuc/divisions/energy-division/building-decarbonization>. The CPUC notes: “SCE data is impacted by the fact that it is a single-fuel electric-only utility that lacks insight into its customers’ gas usage, unlike PG&E and SDG&E. SCE implemented changes in 2024 to the way it tabulates information received from builders, and future reports from SCE will provide data that better accounts for customer gas usage.”